

Condensed Matter Physics
**MAGNETIC CHARACTERIZATION OF IRON OXIDE BASED THIN FILMS
PREPARED BY METALORGANIC DECOMPOSITION**

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Nanostructures of iron oxide based materials have attracted considerable interest in science and technology for high-density magnetic recording.¹ We have investigated the magnetic properties of an iron oxide film and a cobalt-doped iron oxide film (average thickness of ~ 300 nm) prepared by a metalorganic decomposition method under similar conditions. The X-ray diffraction pattern of iron oxide film indicates an amorphous structure where as that of Co-doped film shows a crystalline structure. Magnetic properties of these films were measured using both SQUID magnetometry and ferromagnetic resonance. While the films show no significant magnetic anisotropy between the film parallel and perpendicular orientations, the magnetic hysteresis loops show that the Co-doped iron oxide film has a very large coercivity of ~ 14 kOe compared of to the coercivity field of less than 0.5 kOe for the iron oxide film. The temperature-dependent magnetization results will also be presented.

¹Y.S. Kang, et al. Chem. Mater. **8**, 2209 (1996)

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